U.S. Department of the Interior U.S. Geological Survey

Onshore elevation data from National Oceanic and Atmospheric Administration (NOAA)

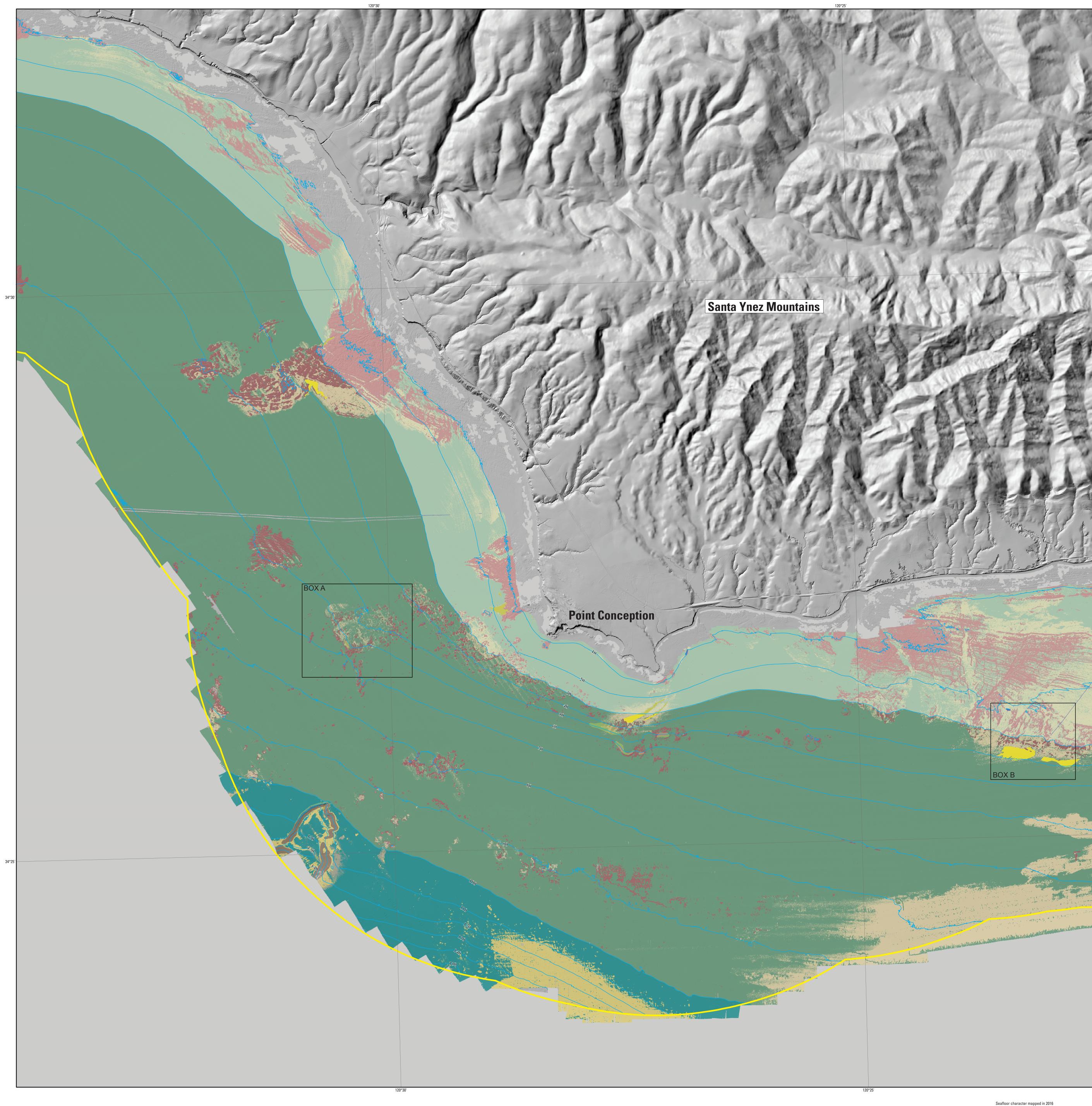
Office for Coastal Management's Digital Coast (available at http://www.csc.noaa.gov/

Dataset (available at http://ned.usgs.gov/). Offshore shaded-relief bathymetry from map on sheet 2, this report. California's State Waters limit from NOAA Office of Coast Survey

digitalcoast/data/coastallidar/) and from U.S. Geological Survey's National Elevation

Universal Transverse Mercator projection, Zone 10N

**NOT INTENDED FOR NAVIGATIONAL USE** 



SLOPE CLASS 1—0 TO 5 DEGREES

coarse-grained sand, gravel, cobbles, and bedrock Rock and boulder, rugose—High backscatter, high rugosity; typically boulders and rugose Medium- to coarse-grained sediment—Very high backscatter, low rugosity; typically medium-

medium-grained sand; often rippled and (or) burrowed Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically coarse-grained sand, gravel, cobbles, and bedrock Rock and boulder, rugose—High backscatter, high rugosity; typically boulders and rugose Medium- to coarse-grained sediment—Very high backscatter, low rugosity; typically mediumto coarse-grained sediment, with varying amounts of shell hash; in scour depressions

medium-grained sand; often rippled and (or) burrowed Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically coarse-grained sand, gravel, cobbles, and bedrock Rock and boulder, rugose—High backscatter, high rugosity; typically boulders and rugose

medium-grained sand; often rippled and (or) burrowed coarse-grained sand, gravel, cobbles, and bedrock

SLOPE CLASS 2—5 TO 30 DEGREES Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to medium-grained sand; often rippled and (or) burrowed

**EXPLANATION OF MAP SYMBOLS Area of "no data"**—Areas near shoreline not mapped owing to insufficient high-resolution seafloor mapping data; areas beyond 3-nautical-mile limit of California's State Waters were not mapped as part of California Seafloor Mapping Program 3-nautical-mile limit of California's State Waters

Contour interval: 10 m

## **DESCRIPTION OF MAP UNITS**

DEPTH ZONE 2—INTERTIDAL TO 30 METERS WATER DEPTH

Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to medium-grained sand; often rippled and (or) burrowed Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically

to coarse-grained sediment, with varying amounts of shell hash; in scour depressions Rugged anthropogenic material—High backscatter, high rugosity; related to development by

DEPTH ZONE 3-30 METERS TO 100 METERS WATER DEPTH

SLOPE CLASS 1—0 TO 5 DEGREES Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to

Rugged anthropogenic material—High backscatter, high rugosity; related to development by SLOPE CLASS 2—5 TO 30 DEGREES Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to

DEPTH ZONE 4—100 METERS TO 200 METERS WATER DEPTH SLOPE CLASS 1—0 TO 5 DEGREES

Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically Rugged anthropogenic material—High backscatter, high rugosity; related to development by

Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically coarse-grained sand, gravel, cobbles, and bedrock Rock and boulder, rugose—High backscatter, high rugosity; typically boulders and rugose

Bathymetric contour (in meters)—Derived from modified 2-m-resolution bathymetry grid.

## **DISCUSSION**

This seafloor-character map of the Offshore of Point Conception map area in southern California was produced using video-supervised, maximum-likelihood classification of the bathymetry and backscatter (intensity of return) signals from sonar systems (see Golden and Cochrane, 2013, for a summary of the video data collected for the purpose of supervising the classification). Rugosity (a GIS-derived characterization of roughness) and backscatter intensity were used as variants in the classification. The interpreted classifications were then draped over shaded-relief bathymetry (see sheet 2). The substrate classes mapped in this area have been divided into the following California Marine Life Protection Act depth zones: Depth Zone 2 (intertidal to 30 m), Depth Zone 3 (30 to 100 m), and Depth Zone 4

(100 to 200 m). In addition, the following slope classes are represented on this map (Coastal and Marine Ecological Classification Standard slope zones are shown in parentheses): Slope Class 1, 0° to 5° (flat); and Slope Class 2, 5° to 30° (sloping). Depth Zone 1 (intertidal), Depth Zone 5 (greater than 200 m), and Slope Classes 3 to 5, greater than 30° (steeply sloping to overhang) are not present in this map area. Fine- to medium-grained smooth sediment (sand and mud) makes up 83.0 percent (107.1 km²) of the map area: 13.2 percent (17.0 km²) is in Depth Zone 2, 64.5 percent (83.3 km²) is in Depth Zone 3, and 5.3 percent (6.8 km²) is in Depth Zone 4. Mixed smooth sediment (sand and gravel) and rock (that is, sediment typically the map area: 3.1 percent (4.1 km²) is in Depth Zone 2, 4.7 percent (6.1 km²) is in Depth Zone 3, and 0.1

forming a veneer over bedrock, or rock outcrops having little to no relief) make up 7.9 percent (10.1 km²) of percent (0.1 km<sup>2</sup>) is in Depth Zone 4. Rock and boulder, rugose (rocky outcrops, boulder fields, and asphalt mounds having high surficial complexity) makes up 8.8 percent (11.4 km²) of the map area: 4.7 percent (6.1 km²) is in Depth Zone 2, 2.2 percent (2.9 km²) is in Depth Zone 3, and 1.9 percent (2.4 km²) is in Depth Zone 4. Medium- to coarse-grained sediment makes up 0.2 percent (0.3 km²) of the map area: less than 0.1 percent (0.1 km<sup>2</sup>) is in Depth Zone 2, 0.2 percent (0.2 km<sup>2</sup>) is in Depth Zone 3, and less than 0.1 percent (<0.1 km<sup>2</sup>) is in Depth Zone 4. Rugged anthropogenic material makes up 0.1 percent (0.1 km²) of the map area: less than 0.1 percent (<0.1 km<sup>2</sup>) is in Depth Zone 2, and 0.1 percent (0.1 km<sup>2</sup>) is in Depth Zone 3 (table 1).

REFERENCE CITED Golden, N.E., and Cochrane, G.R., 2013, California Seafloor Mapping Program video and photograph portal: U.S. Geological Survey, Coastal and Marine Geology Program data portal, available at https://doi.org/

10.5066/F7J1015K.

Marine Life Protection Act Depth Zones 2, 3, and 4.

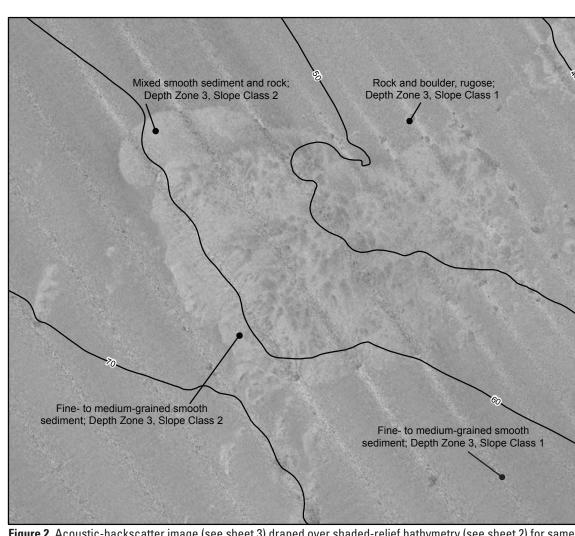
Depth Zone 2 Depth Zone 3 Depth Zone 4



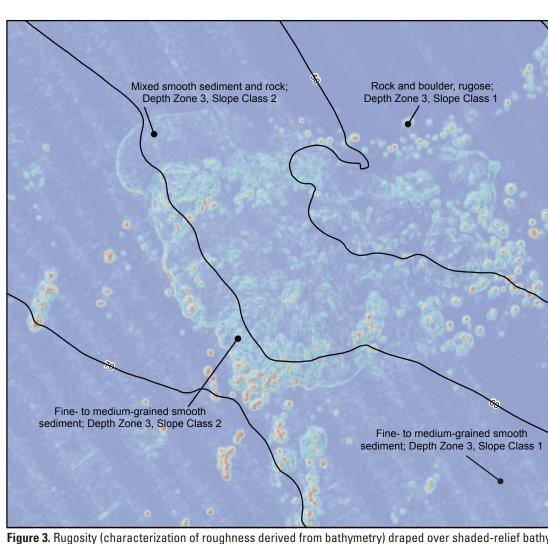




Depth Zone 3 (30 to 100 m), and Slope Classes 1 and 2 (0°–30°). Fine- to medium-grained smooth sediment is shown in shades of green; mixed smooth sediment and rock is shown in shades of tan; and rugose rock and boulder is shown in shades of pink. Bathymetric contours (40, 50, 60, and 70 m) shown for depth reference.

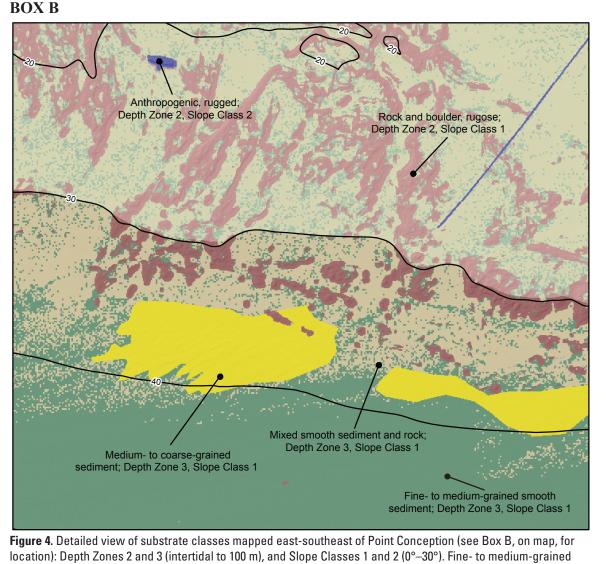


area as figure 1 (Box A on map). Brighter areas indicate coarse-grained, rough, or hard seafloor; darker areas indicate unconsolidated (loosely packed) sediment. Northwest-southeast-trending areas of high backscatter are data-collection artifacts. Interpreted substrate classes from figure 1 included for comparison. Bathymetric contours (40, 50, 60, and 70 m) shown for depth reference.



(see sheet 2) for same area as figure 1 (Box A on map). Rugosity values are displayed in muted "rainbow" color spectrum that ranges from purple (low rugosity) through green (medium rugosity) to red (high rugosity). Northwest-southeast-trending areas of high rugosity are data-collection artifacts. Interpreted substrate classes

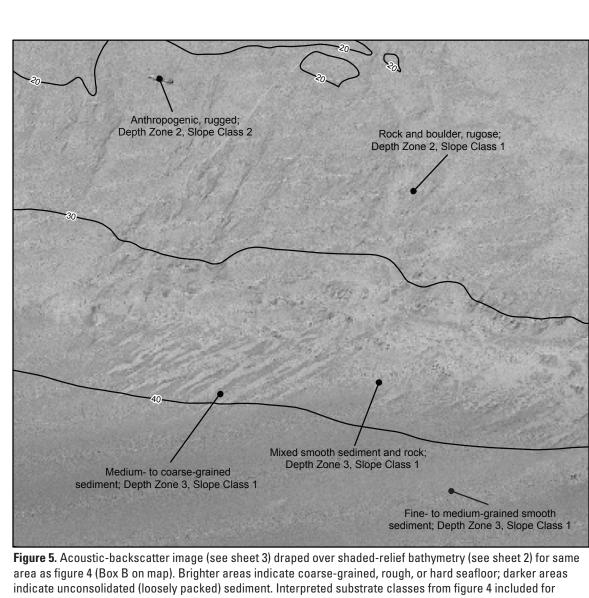
from figure 1 included for comparison. Bathymetric contours (40, 50, 60, and 70 m) shown for depth reference.



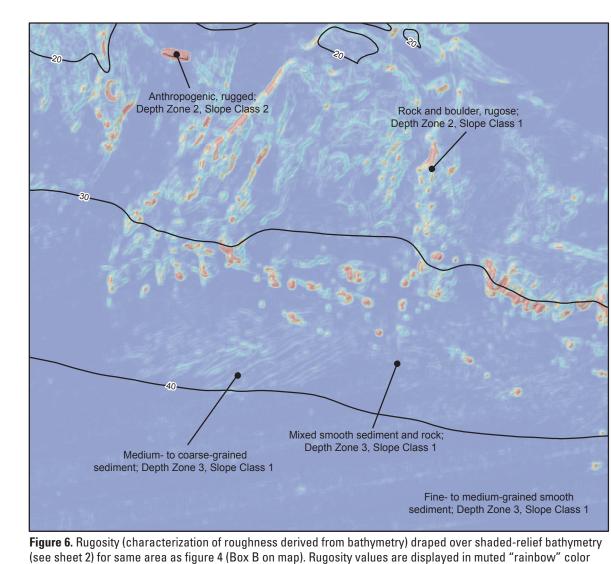
smooth sediment is shown in shades of green; mixed smooth sediment and rock is shown in shades of tan; rugose rock and boulder is shown in shades of pink; medium- to coarse-grained sediment is shown in shades of yellow; and rugged anthropogenic features are shown in shades of purple. Bathymetric contours (20, 30, and 40 m) shown for depth reference.

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comparison. Bathymetric contours (20, 30, and 40 m) shown for depth reference.



spectrum that ranges from purple (low rugosity) through green (medium rugosity) to red (high rugosity). Interpreted substrate classes from figure 4 included for comparison. Bathymetric contours (20, 30, and 40 m) shown for depth

BATHYMETRIC CONTOUR INTERVAL 10 METERS

ONE MILE = 0.869 NAUTICAL MILES